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10/696,474	10/29/2003	Carlo Filippo Ratti	D-22	6969

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EXAMINER	
NEWMAN, MICHAEL A	
ART UNIT	PAPER NUMBER
2624	
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04/05/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/696,474	RATTI ET AL.	
	Examiner	Art Unit	
	MICHAEL A. NEWMAN	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 10-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 10-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on August 4th, 2010 has been entered.

2. In view of the amendment to the claims, the amendment of claims 1, 4, 5, 10, 13 and 17, and the cancellation of claims 8 and 9 have been acknowledged.

3. In view of the cancellation of claims 8 and 9, the statutory double patenting rejection of claims 2, 3, 8 and 9; the non-statutory double patenting rejection of claim 9; the 35 U.S.C. 102 rejection of claims 8 and 9; and the 35 U.S.C. 103 rejection of claims 8 and 9 have been withdrawn.

4. In view of the amendment to claims 1 and 13, the non-statutory double patenting rejection of claims 3, 4, 7, 14 and 16, and the 35 U.S.C. 102 rejection of claims 1 and 13 have been withdrawn.

Response to Arguments

5. Applicant's arguments, see pages 6 – 7 of the Remarks, filed on August 4th, 2010, with respect to the double patenting rejection of claims 3, 4, 7, 14 and 16 have been fully considered and are persuasive. The double patenting rejection of the claims has been withdrawn.

6. Applicant's arguments, see pages 9 – 12 of the Remarks, with respect to the 35 U.S.C. 103 rejection of claims 1 – 4 and 10 – 17 over Anderson et al. (U.S. Patent No. 6,259,815), "Anderson" and Machtig (U.S. Patent 5,221,937), "Machtig"; have been fully

considered and are persuasive. The 35 U.S.C. 103 rejection of claims 1 – 4 and 10 – 17 over Anderson and Machtig has been withdrawn.

7. Applicant's arguments with respect to claims 1 and 13 have been considered but are moot in view of the new ground(s) of rejection.

a. In pages 7 – 8 of the Remarks, regarding the 35 U.S.C. 102 rejection of the independent claims 1 and 13 over Inami et al. (U.S. Patent No. 6,341,869), "Inami"; Applicant's Representative submits that Inami does not teach the newly added limitations requiring a processor for comparing a three dimensional array of data values with position data to identify selected ones of said data values which have positions in said array that correspond to the geometry of said surface. As correctly noted by Applicant's Representative, Inami teaches a processor (13A). Furthermore, Inami teaches that the processor refers to a virtual space information memory that stores shape models of objects to generate the image (See Inami's Col. 7 lines 35 – 44). Additionally, Inami teaches that the content, shape and position of the image projected on to the screen are changed *so as to follow the change of positions* of the screen. However, Inami does not explicitly teach comparing a three-dimensional array of data values with said position data to identify selected ones of said data values which have positions in said array that correspond to the geometry of said surface. In the new 35 U.S.C. 103 rejection set forth below, Anderson has been introduced to teach such limitations.

b. Regarding dependent claims 2, 3, 14, 15 and 16, Applicant's Representative further submits that although Inami's screen is movable, it is not constructed of a deformable material that may be shaped, as required by the claim language. The Examiner *respectfully* disagrees, Inami does teach that the material used for the body of the screen is preferably light and easy to form into any shape (See Inami's Col. 6 lines 51 – 53).

c. Regarding the 35 U.S.C. 103 rejection of claims 4 – 7, over Inami and Pryor (U.S. Patent No. 5,982,352), "Pryor"; Applicant's Representative submits that the combination does not teach measuring the position of said surface by measuring the extent to which light is attenuated when passing through said translucent material to reach said surface. The Examiner *respectfully* disagrees. As correctly noted by Applicant's Representative, Pryor teaches a screen consisting of two members that when pressed together cause a bright or dark spot to appear on the screen. The position of the spot is then determined by searching for the bright or dark spot on the surface of the screen. Clearly, by detecting a dark or bright spot *on the screen*, the position of the screen is being measured by measuring any differences in the amount of light passing through the screen (i.e. how much it is or is not attenuated), as required by the claim.

In view of this reasonable interpretation of the claims and the prior art, the Examiner *respectfully* submits that the rejections set forth below are proper.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1 – 4 and 10 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inami et al. (U.S. Patent No. 6,341,869) in view of Anderson et al. (U.S. Patent No. 6,259,815). Hereinafter referred to as Inami and Anderson, respectively.

a. Regarding claims 1 and 13, Inami teaches a method and apparatus for evaluating a three dimensional array of data values comprising, in combination, a manually manipulable physical object which defines a surface whose shape or position may be altered **(Inami Fig. 2 'screen' 11A as described in Col. 6 lines 39 – 53 and Col. 7 lines 18 – 26) [Note that the screen is made of material which is easy to form into any shape, and that manipulating the screen causes a new image to be projected onto it]**, a position sensor for generating position data specifying the geometry of said surface **(Inami Fig. 2 'angle sensors' SE1 and SE2 as described in Col. 8 lines 17 – 19) [Note that the sensors are used to determine the position and posture of the screen]**, a memory device for storing said three dimensional array of data values **(Inami Col. 7 lines 4 – 14 and lines 39 – 44) [Note that the three-dimensional shape models are stored in the virtual space information memory, DB1]**, and a projector for illuminating said surface of said physical object with an image representative of said selected ones of said data values as the shape or position

of said surface is altered during the manual manipulation of said physical object **(Inami Fig. 2 'projectors' 14A as described in Col. 7 lines 4 – 26) [Note that the content, shape and position of the projected image is changed so as to follow the change of positions of the screen]**. Inami further teaches a processor coupled to said position sensor and to said memory device **(Inami Fig. 2 element 13A as discussed in Col. 7 lines 35 – 45)**. In an example, Inami teaches that for an egg-shaped screen, the processor generates an image of an object having an egg shape **(Inami Col. 7 lines 6 – 10)**. Additionally, Inami teaches that when an observer rotates the screen, the content of the image is changed so that the side view image of the object is displayed on the screen **(Inami Col. 7 lines 24 – 26)**. However, Inami **does not explicitly teach** comparing the three-dimensional array of data values with said position data to identify selected ones of said data values which have positions in said array that correspond to the geometry of said surface. **Pertaining to the same field of endeavor, Anderson teaches an object recognition system capable of generating a virtual three-dimensional model by detecting a physical model (Anders Col. 2 lines 30 – 38). Specifically, Anderson teaches scanning, with a camera and laser striper, a model formed by a user from moldable clay. The scan is then compared to stored three-dimensional templates to identify the object (Anderson Col. 2 lines 43 – 54). More specifically, the scanning results in scanned volumetric data in the form of voxels (Anderson Col. 3 lines 8 – 17). Therefore, as part of the comparison, the**

templates are also converted into voxels so that they can be directly compared with the voxels of the scanned volumetric data (Anderson Col. 4 lines 53 – 65) [Note that voxels can be reasonably considered to be three-dimensional arrays of data values]. Anderson further teaches that the system allows for objects to be automatically recognized and identified (Anderson Col. 5 lines 55 – 62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rasterize into voxels the three-dimensional shape models of objects held in Inami's virtual space information memory, and to compare the screen shape and position determined by Inami to the stored model voxels, as taught by Anderson, in order to automatically and accurately determine what position or portion of the shape models should be projected onto the screen, as clearly desired by Inami.

b. Regarding claims 2, 3, 14, 15 and 16, Inami, in view of Anderson, further teaches that said physical object is constructed of a material which forms a surface whose geometry varies when said object is manually manipulated (and retains its shape after being deformed) and upon which an image may be projected and viewed by a user **(Inami Fig. 2 'screen' 11A as described in Col. 6 lines 39 – 53) [Note that the screen is made of material which is easy to form into any shape, and that by manipulating the screen, a new image is projected onto it]**.

c. Regarding claim 4, Inami, in view of Anderson, teaches all the limitations of the independent claim 1, as set forth in the 35 U.S.C. 103 rejection of claim 1 above. As discussed, above, Inami uses mechanical location and deformation detection sensors **(Inami Fig. 2 'angle sensors' SE1, SE2)**. However, Inami **fails to teach** that the one or more real-time position and geometry sensors include one or more laser scanners. **Anderson, as part of its object recognition system capable of matching a stored volumetric template to an input physical object, teaches using a laser striper scan to generate the volumetric scan (Anderson Col. 2 lines 43 – 47). Anderson further teaches that the laser striper scan allows for refined shapes of the object to be determined (Anderson Col. 3 lines 10 – 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor the movement and shape of the Inami's screen by monitoring the deformation of a scanned laser projection with a camera, as taught by Anderson, thereby allowing for greater screen shape details to be measured and thus improving Inami's posture and position determination and, as a result, the accuracy of the projected image.**

d. Regarding claims 10 and 17 Inami, in view of Anderson, further teaches the method and system for evaluating a three dimensional set of point values as set forth in claims 1 and 15, respectively, wherein said physical object comprises an aggregation of smaller movable objects and wherein said step of manually manipulating said physical object to reposition said three dimensional surface to

cause a new image representative of a different subset of said point values to be projected onto said three dimensional surface is performed by moving one or more of individual ones of said smaller movable objects **(Inami Fig. 2 'arms' 162 – 164 as described in Col. 8 lines 6 – 26) [Note that the 'physical screen assembly' includes the individually movable supporting arms, that upon moving cause a change in the posture or position of the screen and thus a new image to be projected as previously discussed]**.

e. Regarding claim 11, Inami, in view of Anderson, further teaches the method for evaluating a three dimensional set of point values as set forth in claim 10, wherein said smaller objects comprise rectilinear blocks of material **(Inami Fig. 2 ' arms' 162 – 164) [Note that the arms are substantially rectilinear]**.

f. Regarding claim 12, Inami, in view of Anderson, further teaches the method for evaluating a three dimensional set of point values as set forth in claim 10, wherein said smaller objects comprise substantially spherical beads **(Inami Col. 6 lines 51 – 56) [Note that the moldable material also includes glass beads]**.

10. Claims 5 – 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inami et al. (U.S. Patent No. 6,341,869) in view of Anderson et al. (U.S. Patent No. 6,259,815) as applied to claim 1 above, and further in view of Pryor (U.S. Patent No. 5,982,352). Hereinafter referred to as Inami, Anderson and Pryor respectively.

a. Regarding claims 5 – 7, Inami, in view of Anderson, teaches all the limitations of the independent claim 1 as set forth in the 103 rejection of claim 1 above. Inami further teaches that the screen contains glass beads **(Inami Col. 6 lines 53 – 55)**. However, **Inami fails to teach** that the position sensor measures the position of said surface by measuring the extent to which light is attenuated when passing through said translucent material to reach said surface. **Pertaining to the same field of endeavor, Pryor teaches a user-interactive screen in which the position of the screen deformation triggered by user-force is monitored by (1) projecting light across the screen's thickness, and (2) using a camera system to locate the change from light to dark (or vice-versa) caused by variation in thickness of the screen (Pryor Col. 32 lines 41 – 50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor the location of Inami's screen surface by monitoring changes in the screen's light conductance, as taught by Pryor, thereby eliminating the need for Inami's mechanical components and enjoying a reduction in weight, manufacturing material and maintenance costs associated with mechanical fatigue common in joints.**

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. NEWMAN whose telephone number is (571)270-3016. The examiner can normally be reached on Mon - Thurs from 9:30am to 6:30pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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